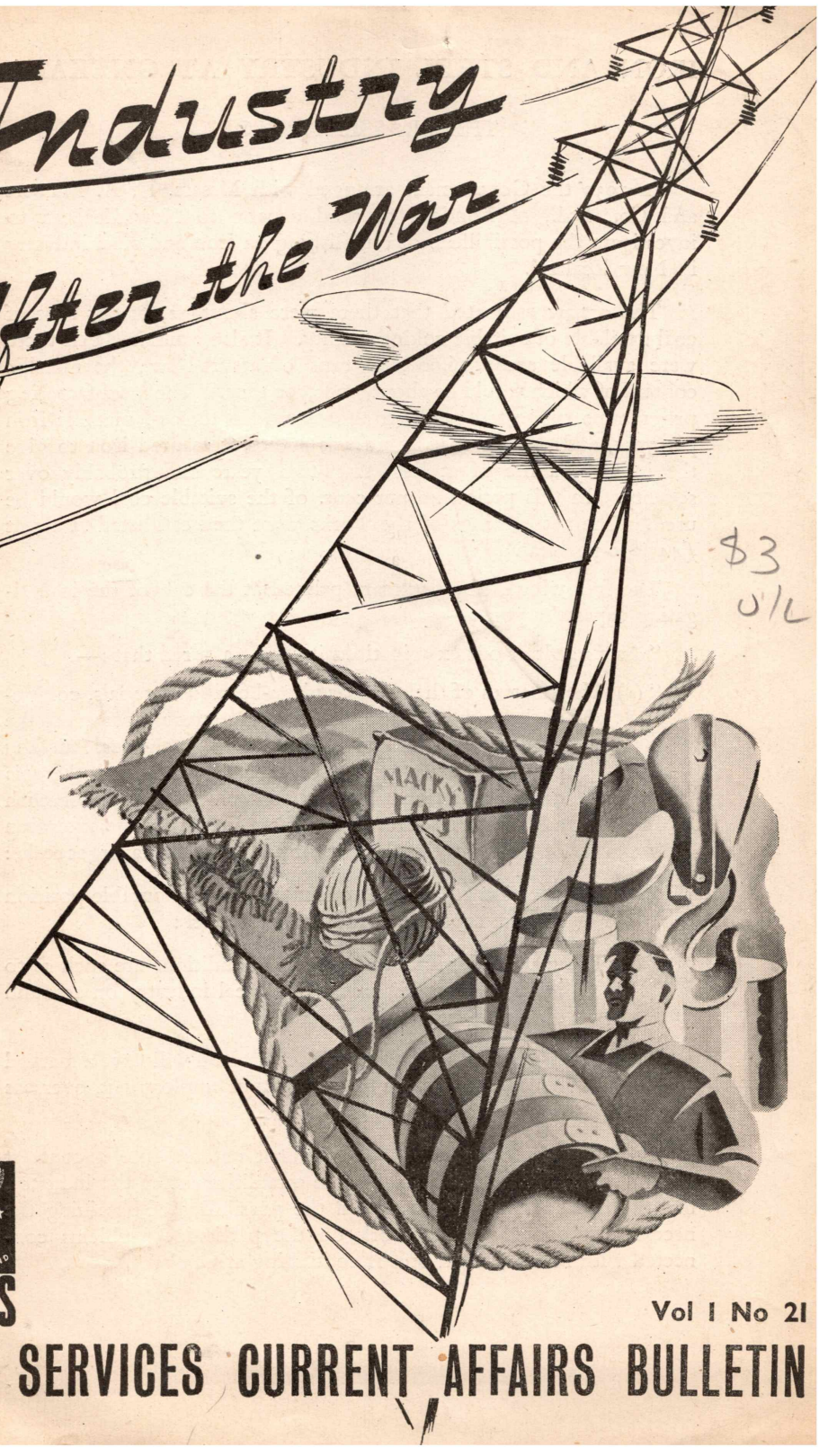
Industry After the War



NEW ZEALAND
AEWS

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N.Z. SERVICES CURRENT AFFAIRS BULLETIN

IRON AND STEEL INDUSTRY AT ONEKAKA

THE BRASSERT REPORT

In 1939 the Government arranged with Messrs. H. A. Brassert and Co., Ltd., of London, to send experts to New Zealand to investigate the possibilities of establishing an iron and steel industry in New Zealand.

The report estimated that there were about 32,000,000 tons of coal available of suitable coking quality. It also estimated that there were available some 16,000,000 tons of assured ore, the metallic content of which would be about 7,000,000 tons. The manufacturing programme suggested required about 115,000 tons of metallic iron per year, and on this basis there was sufficient assured iron to give the industry a life of at least sixty-two years and probably over seventy. In this period 40 per cent. of the suitable coal would be used. The net earnings of the works were then estimated at about £445,000 per year.

The following is the summary printed at the end of the investigating experts' report :—

" As a result of our examinations it can be assured that :—

" (*a*) The reserves of the necessary iron-bearing materials, coking-coal, limestone, and dolomite are adequate to meet the needs of an iron and steel industry on the scale already proposed for a period of seventy years, and there is every indication that further exploration will establish additional resources of iron-ore for either the extension of the life of the plant or for production on a larger scale :

" (*b*) The location at Onekaka offers the most favourable position for the economic production of steel :

" (*c*) The market demand and the local conditions are such as to justify the establishment of a steel industry on a sound economic basis :

" (*d*) The manufacture of steel in New Zealand will have a marked beneficial effect on the problem of employment, overseas finance, and national defence."

Following the report, the Government entered into a contract with Messrs. Brassert and Co. for the establishment of the industry, but the outbreak of war precluded the possibility of obtaining the necessary plant. Research work on the particular problems connected with New Zealand ores is continuing at Onekaka.

INDUSTRY AFTER THE WAR

By R.O. Page, Industrial Chemist, Christchurch

PART I.—GROWTH OF NEW ZEALAND'S SECONDARY INDUSTRIES

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8. The Possibilities of Plastics
9. Development in North or South Island ?
10. Factories in the Smaller Towns.

The story of the development of New Zealand's secondary industries is summarized at the end of the bulletin.

PART I.—GROWTH OF NEW ZEALAND'S SECONDARY INDUSTRIES

1. Our Secondary Industries are Efficient

When a New-Zealander thinks of his country's wealth he usually thinks of bales of wool in a shearing-shed, of cases of butter being slung into holds of an overseas liner, and of carcasses of mutton piled high along the walls of a freezing-chamber. In other words, he thinks in terms of our primary products.

Industrialization conveys to him a picture of the huge and intensively developed industrial organization of England and the United States—a picture which he thinks unsuited to New Zealand's economic scheme. Indeed, most New-Zealanders think of their country as naturally suited to farming but lacking the resources and the markets necessary for an economic and efficient development of secondary industries.

This picture of New Zealand's economy is both incomplete and misleading.

An English economist, Colin Clark, found that New Zealand's secondary industries were amongst the most efficient in the world. Comparing the value of the output per man in the various countries, he placed the United States of America first with 100, New Zealand second with 88, and Great Britain third with 82.

2. Primary Industries *v.* Secondary Industries

Not only are our secondary industries surprisingly efficient when viewed in the light of this comparison, but they have produced in recent years even greater wealth than our primary products. In 1940–41 the value of our farm products was £74,000,000 ; in the same year the output of our secondary industries was valued at £87,000,000 ; and this figure does not include the meat-freezing and dairying industries concerned with the processing of primary products for export.

The volume of production is equally noteworthy. In the same period, when conditions had not been greatly affected by the war, the total value of the output of our 6,000 factories was £147,000,000 and the wage bill of the 114,000 employees was over £27,000,000.

3. How have Our Industries developed ?

That a country with apparently few natural advantages for manufacturing should have developed such efficient secondary industries is in itself surprising. The reason is to be found in the history of New Zealand's economy. The story of the development of our secondary industries is summarized at the back of this bulletin. For the moment it is important to note the intentions of the early settlers in planning the economic organization of the country.

Determined to avoid a reproduction of the squalor of the Old World industrial cities, the first emigrants sought to establish the colony as a rural community. Consequently, the first settlers were mainly farmers and farm labourers, with a sprinkling of tradesmen—sawyers, carpenters, blacksmiths, cobblers, &c.—necessary to provide shelter and services for a rural population.

Such secondary industries as did develop were simply a natural response to the needs of the community, and no effort was made by tariffs or other forms of protection to force their growth. If they flourished, they did so because they were efficient and as long as they were efficient.

In the sailing-ship days New Zealand's timber and flax were ideally suited for the manufacture of spars and rigging, and from these resources there grew an extensive ship-building industry. (It must be remembered that in those days the chief means of transport and communication within the colony was by sea.) The new industry was able to fulfil a need within the community, and it prospered. But with the replacement of sail and wood by steam and steel, New Zealand's advantages as a ship-building centre declined and the industry died.

4. What Industries developed ?

Under these conditions it was natural that the industries which developed would be those most suited to our resources and would be largely concerned with food, clothing, shelter, power, heat and light, and what might be termed the servicing industries—engineering, printing, motors, fertilizers.

A diagram on page 6 shows the rate of increase in the value of output from our secondary industries from 1931 to 1941. In eight years the value of our factory production has more than doubled.

In recent years the value of farm production has increased more slowly, as the other diagram on page 6 demonstrates. In ten years it has risen £10,000,000.

PART II.—THE IMPACT OF WAR ON INDUSTRY

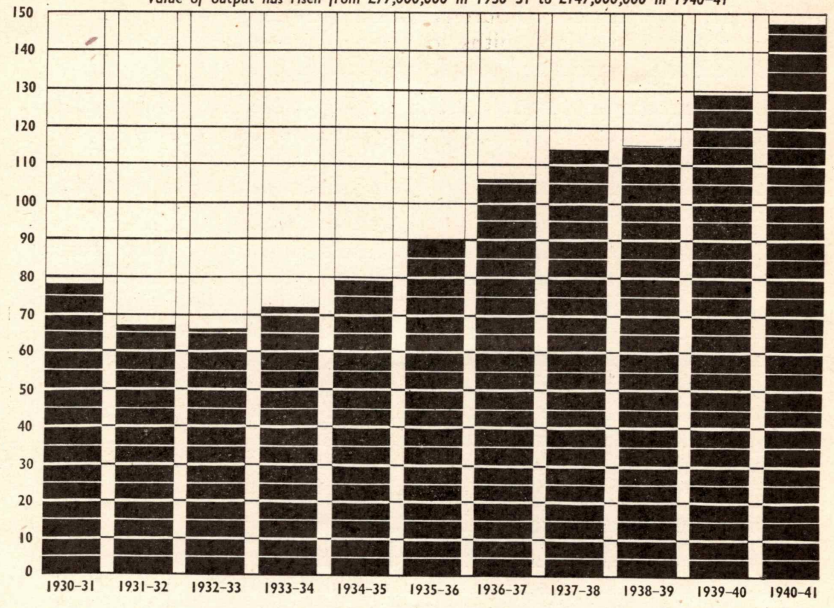
1. Some Industries have declined

The war has had a considerable effect on our secondary industries. Because of restrictions on world automobile production and also because of the shortage of petrol, the output of our motor-assembly plants and garages has been greatly reduced.

Similarly, the loss of Nauru Island has appreciably affected the output of our fertilizer-works. However, the reduced amount of superphosphate available has been mixed with local serpentine, and it is hoped to increase the output further by the use of large deposits of low-grade phosphate rock discovered at Clarendon, Otago.

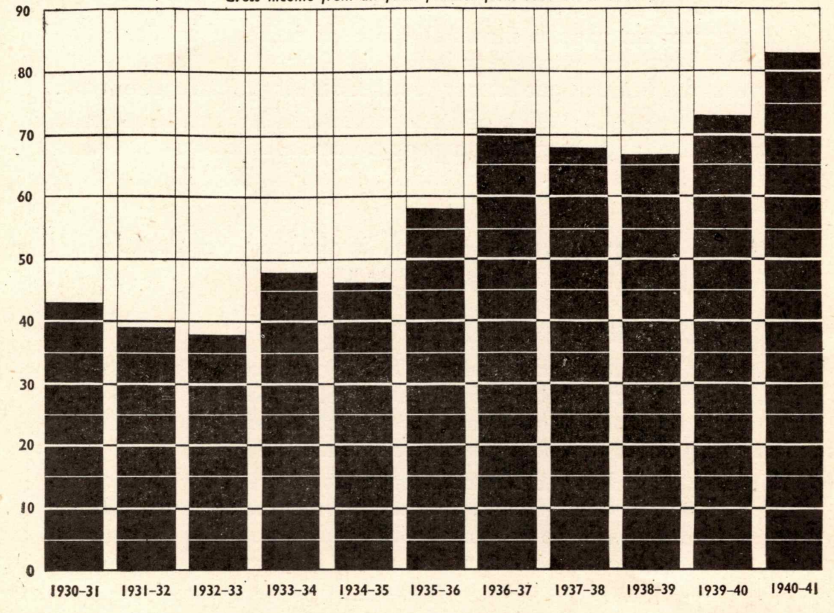
HOW N.Z.'s FACTORY PRODUCTION HAS INCREASED

Value of output has risen from £77,000,000 in 1930–31 to £147,000,000 in 1940–41



WHAT FARMING MEANS TO N.Z.

Gross income from all farm produce from 1930–31 to 1940–41



2. Output of others has increased

On the other hand, the demands of the Services and the restriction of imports has greatly increased the output of our tanneries, boot-factories, woollen-mills, and clothing-factories.

A wartime development has been the processing of linen flax, now grown in New Zealand at the request of Great Britain. The main pre-war supply of linen flax came from the Baltic States and the adjacent parts of Poland and Russia, and the devastation of the two latter countries indicates that our output will still be necessary after the war.

Our engineering shops, in addition to manufacturing machinery for the new linen-flax industry and for the expansion of existing industries, has done much direct munition work, producing the component parts of all types of war material in widely-distributed factories.

The necessary accuracy of these small parts has been made possible by the standardization of testing gauges, which are made at a central physical testing laboratory established in Wellington.

3. Canning and Dehydration

Transport difficulties and the location of our troops in tropical areas have resulted in a development of our food-preservation industries. The ubiquitous " M and V " ration bears witness to the increase in the output of our canning industry, and there has also been a considerable increase in the amount of meat, fruit, and vegetables canned.

Even more important has been the development of the dehydration of foodstuffs. Dried foods need less space than refrigerated ones and can be sent as ordinary cargo. Thus some 10,000 tons of dehydrated butter are now being produced annually, and a meat-drying plant is in operation.

Fruit and vegetables (potatoes, parsnips, carrots, onions, and cabbage) are also being dehydrated, and a number of new factories are planned.

4. What We once wasted

Most New-Zealanders have been astonished at the reclamation of what were, in pre-war days, considered waste products. Waste paper and scrap metals have been collected and re-used. Two factories are reclaiming several hundred tons of rubber annually, mainly from old tires. The entry of Japan into the war not only cut off a main source of rubber from the Allies, but also of agar, a substance used in bacteriological work and canning. It is now being made in New Zealand from a local seaweed.

PART III.—NEW ZEALAND INDUSTRIES: POST-WAR POSSIBILITIES

Food for Post-war Europe

We have seen how New Zealand's secondary industries have grown until they are considered by experts to be amongst the most efficient in the world and how they have been affected, some adversely, some beneficially, by war conditions. That we can, within limits, support secondary industries, experience has shown. What place will these industries have in the post-war world? Will the changes produced by the war continue? In what industries can our returning Forces best be placed? What further articles can we brand "Well made, New Zealand"?

Undoubtedly the starving and scantily-clad peoples of Europe and Asia will need, for a considerable time after the war, all the dairy products, meat, and wool we can provide. Thus every increase we can make in our primary production will be a valuable contribution to the welfare of the world. But once the initial shortages have been made up, how will the increased agricultural production of England (hitherto the greatest consumer of our farming exports) affect the future demand for our butter and wool?

2. Our Primary Products compete with Substitutes

The war has also brought about improvements in such substitutes as margarine and staple fibre, and in the post-war world it is with these and other substitutes that our primary products must compete.

To the palate, margarine already closely resembles butter and the addition of vitamins raises its nutritional value. Staple fibre and lanital cannot yet compete with wool in warmth and durability even though they do not shrink and are more resistant. There is, however, the possibility of another synthetic competitor being produced which may prove as serious a rival to wool in quality as nylon is to silk.

It is likely, however, that these synthetic competitors will, in post-war years, keep the prices of our butter and wool down to a level which will make it difficult to farm profitably some of our marginal lands. Rehabilitation of soldiers on new land may therefore prove uneconomic and it may be necessary to embark on a programme of closer settlement of the land already being farmed.

3. New Developments

After the war New Zealand may have her own iron and steel industry, using the deposits of iron-ore discovered at Onekaka, in the Nelson district.

Cheap water power in the South Island would assist in the establishment of a light-metals industry. Magnesium, which is produced either from sea-water or magnesite (found in fairly large quantities in New Zealand), could thus be produced in the Sounds district, where water power is plentiful.

However, both magnesium and aluminium are now being produced in huge quantities and their price has, even during wartime, decreased. It seems that after the war there will be a glut of these metals on a cheap market—not a favourable moment for the birth of a light-metals industry in New Zealand.

But this very fact will probably stimulate the demand, particularly in the field of transportation, and ultimately lead to increased production.

Both magnesium and ferro-alloys (used in making modern alloy steels) need a large amount of electric power for their production, and at present we in New Zealand are faced with a shortage of electricity. Any increase in hydro-electric schemes will first of all be needed to supply the normal extra demands for current. But it seems probable that these light metals will become increasingly important and, if a Sounds hydro-electric scheme is developed, the time may come when they will be produced in New Zealand.

Already experiments with beet sugar have been made in South Canterbury and, though the crop requires much labour, the experiments have shown that a higher yield of sugar here than in Europe may make it an economic industry.

4. Will our Existing Industries expand ?

It seems most likely, however, that our post-war industrial expansion will consist, in its initial stages, in the development of existing industries. One of our largest pre-war imports was clothing, but in future New Zealand will probably be more dependent on local production, thus maintaining to a considerable extent the war-time expansion of our woollen-mills and boot and clothing factories.

As previously mentioned, linen fibre will continue to be produced until the Baltic States get back to normal.

Tobacco, too, provides the raw material for industry. At present New Zealand grows a third to a half of the tobacco consumed here, and it is estimated that the amount grown in the Nelson district could be doubled.

5. More Canned and Dried Foods

As well as an extended local market, there may be a demand from the Eastern Pacific for our tinned and dried foods. If the present demand should continue, it would fit in admirably with a scheme for closer settlement of land to produce fruit and vegetables. A recent survey of Waimea County, Nelson, gives an idea of the financial returns from this type of farming. Of 600,000 acres of occupied land, some 8,000 are devoted to apples, stone-fruits, hops, tobacco, tomatoes, and vegetables. From the total acreage the annual value of production is £1,200,000. The 8,000 acres accounts for two-thirds of this amount.

Already butter and cheese are being dehydrated successfully. Milk is dried both as full-cream and skim, but mainly as full-cream. This powdered milk is an extremely valuable food supplement to

those living mainly on cereals and would find a ready market in despoiled Europe and Asia after the war. But now we use our skim milk mainly as a pig-food and so lose its valuable salts, proteins, and vitamins. In powdered form it would have a wide market. Two not insurmountable obstacles are cheapness of production and collection of the skim-milk after it has been separated on the farm.

6. What Else are We wasting ?

The necessity of war has already prompted us to reclaim waste products. What other by-products can we use economically ?

Coal-tar by-products of the gasworks have innumerable uses. More of these by-products would be available if our coal was turned into a smokeless fuel before we shovelled it on the domestic fire.

What of our waste fruits ? Could not they, particularly apples, be used to produce fruit juices, already popular overseas ? The Cawthron Institute is at work on this possibility.

Medicine could use the hormones available in the waste products of our freezing-works. Modern plastics need the casein we can produce from our skim-milk. These and many other articles will in post-war days find a more economic home than the pig-sty or the rubbish-heap.

7. Housing Boom probable

New Zealand, in common with most other countries of the world, faces a serious housing shortage in the immediate post-war period. Even in 1940 the building industry employed nearly 16,000 men and the value of production was over £16,000,000. But, large as these figures are, they will almost certainly be exceeded after the war, when the efforts of the building trade will be concentrated on housing the present flat and room dwellers.

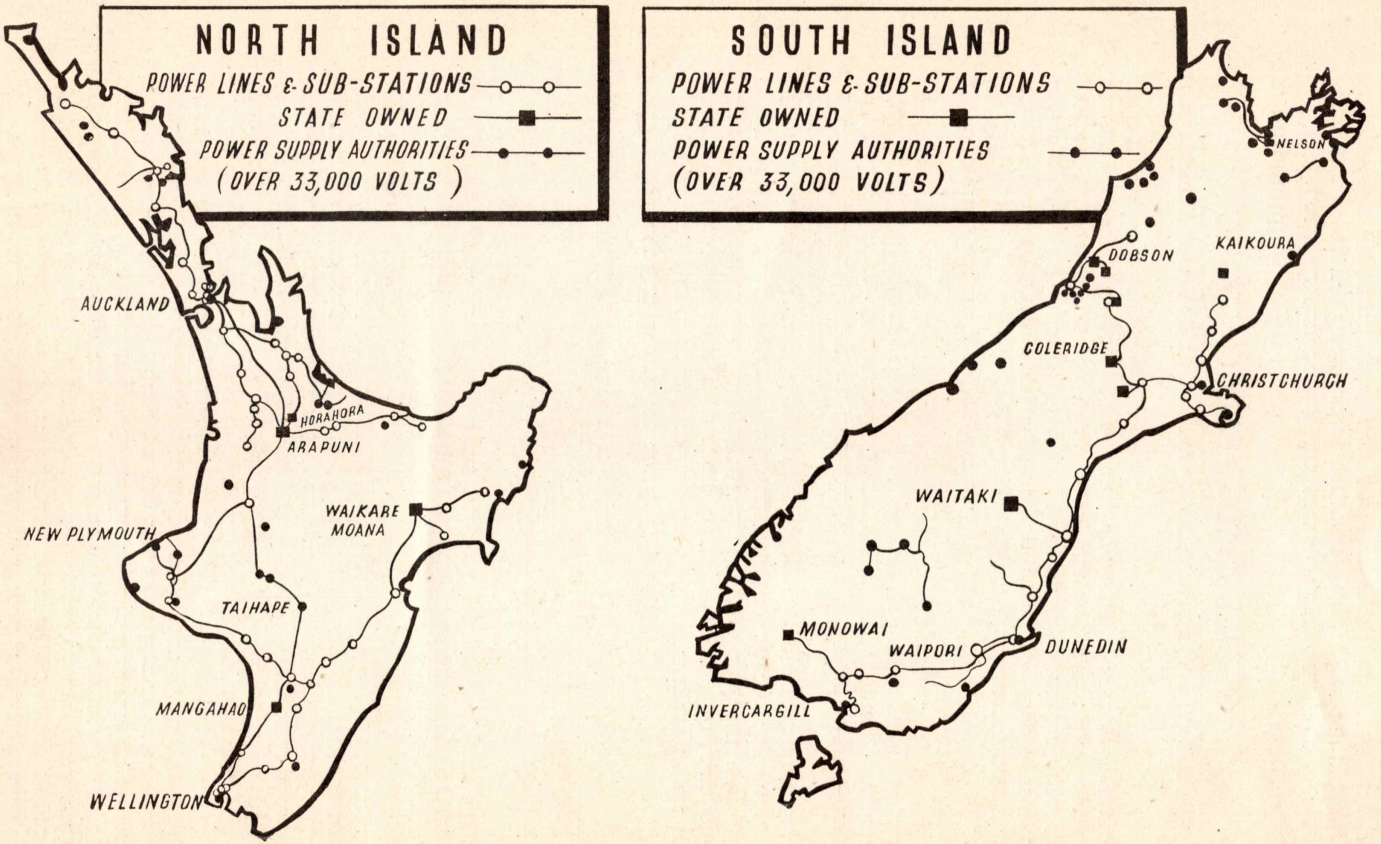
The prosperity of the building industry will demand an increased output from subsidiary industries producing timber, bricks, cement, paints, carpets, and furniture. Great Britain and America will probably be fully employed in the task of rebuilding devastated Europe, and the building requisites produced in both these countries will find a ready market. Thus New Zealand will have to depend on her own resources.

This fact will stimulate the production of such substitutes for roofing-iron as tiles and corrugated asbestos-cement sheets. That we can replace roofing-iron successfully with these substitutes is proved by a substantial increase in the building industry in 1940 when only half our normal quota of corrugated iron was imported.

Well supplied with good-quality sands and clays, New Zealand could also extend her local production of glassware and pottery.

8. The Possibilities of Plastics

Timber will be needed in immense quantities for an extensive house-building programme, but it will also be needed for other purposes. Softwoods are used in the making of wood-pulp for


NORTH ISLAND
POWER LINES & SUB-STATIONS
STATE OWNED
POWER SUPPLY AUTHORITIES
(OVER 33,000 VOLTS)
AUCKLAND
HORA HORA
ARAPUNI
NEW PLYMOUTH
WAIKARE MOANA
TAIHAPE
MANGAHAO
WELLINGTON
SOUTH ISLAND
POWER LINES & SUB-STATIONS
STATE OWNED
POWER SUPPLY AUTHORITIES
(OVER 33,000 VOLTS)
NELSON
DOBSON
KAIKOURA
COLERIDGE
CHRISTCHURCH
WAITAKI
MONOWAI
WAIPORI
DUNEDIN
INVERCARGILL

paper-manufacture and in the production of modern plastics such as rayon, staple fibre (a wool substitute), cellophane, and plywood. The plastic walls of the pre-fabricated houses of the future will come principally from wood. And though the demand may be almost insatiable, the supply will be limited, for the war has caused a rapid depletion of the forests of the Northern Hemisphere. New Zealand has in the past found wealth in her forests. After the war, what remains will be of immense value.

Even New Zealand's poorer land will readily support exotic softwood trees. The rate of growth of *Pinus insignis*, even on poor Nelson land, averages from 3 ft. to 5 ft. a year. Large-scale afforestation schemes on suitable country should therefore yield profitable returns, and not only would such schemes produce a valuable future asset, but they would also be an essential part of any plan to check soil erosion.

Such plantations, if they are to produce a commercial return, must be located in readily accessible and comparatively easy country, and New Zealand seems to possess sufficient quantities of such land at present producing little return.

Pinus insignis, apparently the tree which flourishes best even in poor country, is difficult to pulp successfully. Better methods of treating it could probably be devised, but it seems worth while to experiment with other varieties of softwoods.

9. Development in North or South Island ?

In planning future industries in New Zealand it is important to remember their dependence on cheap electric power. The development here considered to be most likely involves the setting-up of many small, often scattered, industrial units. Fortunately in the type of industry suggested such small plants can be operated efficiently through the use of electricity.

But it has been estimated that half the water-power of the North Island that can be economically harnessed is already being utilized. This fact would indicate that a larger portion of any major industrial development in the future must be in the South Island.

10. Factories in the Smaller Towns

Many of the industries considered will be best situated near the primary products that provide their raw material. Our post-war factories may therefore be found mainly in the smaller country towns. And with the help of hydro-electric power, the ideal of the early colonists, to avoid the congestion and squalor of the old world industrial cities, may yet be realized.

DEVELOPMENT OF NEW ZEALAND'S SECONDARY INDUSTRIES

1. Shipbuilding

New Zealand's timber and flax were ideally suited for making spars and rigging. Land-locked harbours with timber down to the water's edge provided ideal sites for ship-yards. By 1840 many

ships had been built at yards distributed from Hokianga to Stewart Island. As well as providing communications within the colony, the industry also catered for the numerous traders and whalers of this period. However, its importance gradually declined as steam replaced sail and steel took the place of wood. Pleasure craft are still built, however, and since the outbreak of war ship-yards in Auckland and Dunedin have been engaged in the building of mine-sweepers and other small vessels.

2. Barrels and Ropes

The early whalers required barrels to store oil, and sailing vessels needed them to store pork and water. Again New Zealand could provide suitable timber, and even after the decline of sail, new industries needed barrels to store tallow, pelts, and beer. The industry has therefore continued to develop.

Our flax provided the raw material for the many ropes required by sailing ships, but in those days the ropes were mainly hand-spun. The mechanization of the industry gave it new life, and to-day the flax is used not only for rope-production, but it is also converted into woolpacks, in which we export a considerable portion of our wool-clip.

3. Flour-mills and Breweries

The early flour-mills were mainly driven by water or by wind. Later, biscuit-factories developed, usually near the mills, and jam and pickle factories were also started. Our present large biscuit and confectionery industry has sprung from these small beginnings.

In the early days beer was practically the only alternative beverage to water, and since the establishment of the first brewery at Thames in 1839 it has been produced in considerable quantity.

4. House-building and Subsidiary Industries

The provision of shelter was one of the pioneers' first concerns, and around this industry many others developed. Sawmills were of prime importance. Where there was suitable clay, bricks were produced and also pipes, tiles, and other necessary types of pottery. Furniture-factories flourished. Recently paints and varnishes have been produced.

5. Transport

The blacksmith's forge was a busy centre in the early settlements. He shod the farmer's horses, repaired his implements, and performed a hundred and one other tasks. As roads developed, the wheelwright and the coachbuilder were also busy men. With the motor-car and tractor came the motor assembly and repair organizations, which were, in pre-war days, amongst our most important industries.

6. Leather

The principal settlements all had their small tanneries converting hides and skins into leather for making and repairing boots and harness. By 1867 they had begun to supply an export demand.

The use of leather in saddlery declined with the advent of the motor-car but now a new want has been supplied with the manufacture of bags, gloves, and leather coats. The boot and shoe industry developed rapidly after its mechanization in the "seventies" until almost our whole local demand is met by our own factories.

7. The Woollen-mills

Hand spinning and weaving supplied the clothing needs of the pioneers, and not until 1870 was the first woollen-mill established in Otago. To-day the volume and quality of our New-Zealand-produced cloth, blankets, rugs, and knitted goods is well known.

The manufacture of clothing began about 1875. To-day it is one of our most important industries both for the value of its product and the number of people employed. Woollen and other textiles are its materials for the manufacture of suits, shirts, dresses, underclothing, and hosiery.

8. Agricultural Implements

Imported agricultural implements were not always sufficiently sturdy to stand up to pioneering conditions, and this stimulated the manufacture of agricultural machinery in Canterbury and Otago. So well were suitable types of implements developed that by 1880 a considerable export trade had been built up with Australia, South America, and South Africa. Later, American competition further stimulated the industry, which to-day is in a stronger position than ever.

9. Engineering

The infant engineering industry also early proved itself capable of meeting both local and export demands. Gold-dredges developed during the gold-rush days were efficient enough to create a demand in other parts of the world. The machines required in freezing-works were largely designed and erected by New Zealand manufacturers. The fertilizer industry, just before the war, produced annually about 500,000 tons of superphosphate. The growth of the dairy industry also created a demand for such engineering equipment as vats, churns, &c.

While steam was the motive power of our factories, the engineering industry produced the many boilers needed, but with the use of electricity instead of coal, the emphasis has shifted to the production of structural steel for the building of dams, bridges, and buildings.

10. Cement

With the erection of large buildings and hydro-electric works and dams as well as the increased use of concrete for roads and bridges, has come a demand for large quantities of cement. New Zealand is fortunate in having plentiful supplies of the necessary raw materials so that, with the installation of modern machinery, both the quantity and quality of locally produced cement has received a considerable stimulus. New uses for concrete such as concrete pipes and roofing-tiles have brought the production of the three large cement-works to 170,000 tons a year.

11. Production of Power

To-day one of our key industries is the production of power not only to supply the motive force for the machines in our factories and on our farms, but also to provide heat and light for our homes and public buildings. The production of both gas and electricity has thus become one of our major industries.

12. Printing

Printing was one of the earliest industries introduced into the colony. To-day it is our third most important industry, judged from the number of people employed—over 8,000.

SUGGESTED READING

"New Zealand Year-Book, 1942." Sections on primary production and manufacturing.

"What of Manufacture?" F. Leathem. Reconstruction Pamphlets.

"Power" and "Manufacturing." New Zealand Department of Internal Affairs, Centennial Branch.

A discussion course entitled "New Zealand's Resources" provides excellent background reading on this subject and is available on application through the U.E.O.

TOPICS FOR DISCUSSION

1. The value of the output of our factories at present far exceeds the value of our primary products. After the war we may be further dependent on our own resources for many articles necessary to maintain our standard of living. Should more emphasis be placed on expanding our secondary industries than on increasing our farm production? Or, since our secondary industries depend directly on the processing of primary products, is that a wrong way of looking at the problem?

Our natural resources are not sufficient or varied enough to allow us to manufacture all we need. Even if they were, could we compete economically with other manufacturing countries? What other factors are concerned? Population, tariff protection, labour costs?

2. Post-war Europe will need food. Would it be better for us to increase our farm production to meet this demand, or to concentrate on expansion of manufacturing? After the initial demand for food in Europe has declined and agriculture is again revived, what markets can we depend on for our primary products? Great Britain was previously our largest consumer. How will the increased British agricultural production brought about by the war effort affect her future requirements of New Zealand butter, wool, and mutton? Will this not depend on whether she maintains her present production of foodstuffs or decides to concentrate on manufacturing?

NOT TO BE PUBLISHED

This bulletin is for use in the armed services only. The matter it contains is not to be communicated, either directly or indirectly, to the press.

3. Will returning soldiers desire to take up farming? If our primary production is to be increased, we will need more farmers and farm labourers. Or will they prefer rehabilitation into industry? If so, in what industries can they be placed with profit both to themselves and to the country? Can some balance be reached whereby a proportion are settled on the land to produce foodstuffs which will provide the raw materials for industry—*e.g.*, tobacco, hops, vegetables, and fruits for canning and dehydration (see bulletin, Part III, Section 9).

4. War economy has brought about the utilization of what we previously considered waste products. In post-war times, will it still be profitable to reuse such things as waste paper, scrap metals, old tires, &c. When the supply of raw material is again available, will the reclamation of waste prove uneconomic?

5. The substitutes for primary products have been greatly improved in wartime and will continue to improve after the war. What effect will this have on primary production? Staple fibre (a wood product) may supersede wool and margarine replace butter, with a consequent serious effect on New Zealand's economy. How can we rearrange our economy to counteract such changes?

6. Electric power is the future motive force of industry. In the North Island most possible sources have already been tapped. Where in the South Island do you consider hydro-electric schemes could be started? Are the suggested locations handy to sources of raw material—*e.g.*, iron-ore, magnesite?

7. If the South Island is to be the source of future electric power, it must also be the centre of future industrial development, unless the power can be carried across Cook Strait. Do you consider this feasible? Where in the South Island could future industries be profitably located?

8. Decentralization of industry is possible with the use of electric power. If the industrial development were planned around the smaller towns, the present drift from the country to the town and from the South Island to the North might be arrested (see Bulletin No. 2, "Our Population Problem"). What advantages does the group see in such a development? What industries do they think might be started near their own home towns?

These bulletins are not official statements. They are compiled from published sources and intended to provide the starting point for group discussions.

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